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AUTHOR Banks, Karen Vlahos; Nolen, Patricia
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ABSTRACT

In light of criticisms that teacher preparation programs do not adequately prepare prospective reading teachers and specialists for actual classroom problems, a study was conducted to determine the accuracy of teacher diagnoses and planning for reading difficulties and to examine differences in coursework preparation and classroom experience. Subjects, 94 education students, were grouped according to their coursework backgrounds as follows: (1) those having taken developmental and diagnostic reading instruction courses, (2) those having taken only diagnostic reading instruction courses, and (3) those having taken only developmental reading instruction courses. Information about the teaching backgrounds of each was also collected. Subjects were asked to develop diagnoses and prescriptive plans for four cases, each characterized by a different reading problem. The responses were evaluated according to the judgments of three experts in the field. Results showed that coursework background and years of teaching experience did not lead to differential performance in diagnosing and planning instruction. In addition, the subjects performed poorly in comparison with expert judgment on all variables examined. (FL)

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TITLE:

DIAGNOSTIC AND PRESCRIPTIVE SKILLS OF TEACHERS AND RELATED SPECIALISTS

AUTHORS:

Karen Vlahos Banks, Ph.D.
Assistant Professor, Education
Northern Virginia Community College
3001 N. Beauregard Street
Alexandria, Virginia 22311

Patricia Nolen, Ph.D.
Professor, Educational Psychology
University of Washington
Seattle, Washington 98195

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DIAGNOSTIC AND PRESCRIPTIVE SKILLS OF
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Abstract

Serious charges have been lodged against teacher preparation programs and performance in the classroom. Large numbers of children are unable to read. Therefore, this study examined the accuracy of diagnoses and planning for reading problems encountered by teachers and related specialists, relative to differences in coursework preparation and teaching experience.

The results showed that coursework background and years of teaching experience did not lead to differential performance on the majority of measures. Subjects did not search information regarding the case studies differentially, nor did they perform differentially regarding diagnostic or prescriptive decision-making. In addition, subjects performed poorly in comparison to expert judgment on all variables examined. The results suggest continuing concern with teacher performance in reading instruction.

DIAGNOSTIC AND PRESCRIPTIVE SKILLS OF TEACHERS AND RELATED SPECIALISTS

Societies in the past depended on the prediction and selection of talent as a means of developing a small group of well-educated people. Modern societies stress the development of large numbers of well-educated people. Therefore, large numbers of children have been required to spend 10-12 years attending institutions whose mission is the development of human abilities to their full potential (Bloom, 1976). The emphasis on development rather than prediction and selection of talent has resulted in the instruction of groups of children varying greatly in academic promise.

The fact of wide individual differences in reading outcomes was established over a century ago with the publication of the first scientific reading test (Ribovich, 1978; Harris, 1963; Smith, 1963). It was reiterated after WW II when group and individual tests reflected tremendous ranges in abilities within grades, with a corresponding high degree of overlap in the abilities of children at different grade level (Harris, 1963). Estimates of the range of reading abilities include a minimum of three-four years and as much as eleven years difference in any given elementary school class (Spache, 1976a; Harris, 1970; Bond and Tinker, 1967). The wide range of graded reading level achievements within a given grade has provided: 1) a critical situation for any who insist on a standard graded curriculum for any grade level, and 2) a challenge to teachers in differentiating reading activities to match individual children's abilities (Betts, 1940).

The failure to develop adequate reading skills has been identified as a major single cause of school failure in this country (Satz, 1978; Strang, 1969). Brown (1978) estimated it to be the major cause of 700,000 yearly school dropouts. Recent surveys have estimated that over 7,000,000 school children have not developed the necessary reading skills for survival (Harris, 1970), and that over 40% of urgan school populations graduate from school with less than 5th grade reading achievement (National Foundation for the Improvement of Education, 1973).

Reading disability may represent developmental precursors of serious emotional problems found in late adolescence and in early adulthood. It has also been suggested that there is a striking relationship between criminal behavior and reading failure (Satz, 1978). While long-term emotional stress has been related to reading failures only recently, its short-term relationship to behavior disturbances has been suggested for years (Durkin, 1978; Carkhuff Associates, 1975; Strang, 1969). Reading disabilities, therefore, seem to influence the intellectual and emotional resources available to a person in coping with day to day circumstances.

In addition, reading competency required of the general public in the 1980's has increased as a result of the greater technological demands of employment opportunities, and the knowledge required for effective participation in social/political decision-making (Kirk, et al., 1978). People will be required to retrain for jobs continuously within one lifetime as automation makes many jobs obsolete (Council of Educational Technology, 1979; Kirk, et al., 1978). In addition, knowledge of social/ political issues require

reading as a way of life to facilitate sound decision-making. Without this continuing quest for information a democratic society is said to be in jeopardy (Tarnopol and Tarnopol, 1976; Gray, 1963; Gans, 1963).

Within the context of the increasing importance of literacy is an increase in the range of student's instructional needs to be met by teachers charged with reading instruction. Teachers must teach classes of 30-40 students, 50% more material in the elementary grades, in 100 hours less instruction time. In some classes 10% of the students are non-English speaking and represent at least 50 different language backgrounds (Washington Post, July 3, 1985). Federal studies of the absence of integrated schools in this country have resulted in massive desegregation programs, which in some cases have changed the ethnic and racial composition of entire school districts (Van Geel, 1978). In addition, current public policy written in the Education for All Handicapped Children Act (PL 94-142) has described traditional restricted educational environments as being inadequate. The Act has resulted in the mainstreaming of children, once excluded from regular classrooms, based on a zero reject principle (Reynolds, 1979; Kennedy, 1978; Martin, 1978; Corrigan, 1978; Turnball, et al., 1976).

Thus the challenge of teaching reading, with an increasing emphasis on remedial diagnosis and planning has placed burgeoning responsibilities on the disciplines having to do with the preparation of teachers and related specialists. The host of instructional and experiential variables in their preparation must be given some accounting to assure efficacy in training and productivity of outcomes.

Teacher education is based on the assumption that training will influence a teacher's diagnostic and prescriptive skills. However, little has been done to examine empirically the impact of teacher preparation on on the performance of these tasks. Until recently the thrust of surveys examining teacher preparation in reading has focused on the number of reading courses required by colleges and universities for teacher certification (Chaplin, 1977; Roeder, Beal and Eller, 1973; Marks, 1971). With teachers themselves citing the need for specific training in diagnostic and prescriptive skills as part of their preservice and inservice preparation (Artley, 1972; Rutherford and Weaver, 1974), Artley suggested that emphasis must be placed now on examining teachers' skills as possible solvers in the reading situation.

To date, only a few empirical studies have considered the teacher in the problem-solving context. For example, there are a few studies of inquiry techniques characterizing the encounter between diagnosticians and client computer simulations of the diagnostic decision-making process in reading (Gil, et al., 1979; Gil, et al., 1978), similar to medical studies questioning the impact of diagnostic and prescriptive training (Bone and Anderson, 1979; Burzinski, et al., 1979). However, these studies have not yet been related to purposes of teacher training, nor are their data relevant to teacher training and performance in reading diagnosis and prescriptive decision-making. Therefore, the purpose of this study was an examination of the accuracy of diagnosis and planning for reading problems commonly encountered by teachers and related specialists, relative to differences in coursework preparation and teaching experience.

The reasons for defining the problem according to preparation and experiential parameters are as follows: 1) currently teachers are held accountable for students' reading successes or failures; 2) reading specialists provide a comparison group of professionals who previously have been held responsible for the diagnosis and treatment of reading problems; 3) while the total number of hours of couresework in a particular content area has not been demonstrated to be a good predictor of performance (Ausubel and Robinson, 1969) the accumulation of a variety of courses in the reading field is an important element in certification programs (Spache, 1976a). Thus coursework preparation and the number of years of teaching experience, which are thought to includence teacher performance (Spache and Baggett, 1965) have been included as independent variables. Dependent variables were measures of how teachers and related specialists search for information to make diagnostic and prescriptive decisions. The diagnostic and prescriptive decisions made were also dependent variables.

Methodology

The research design utilized in the study was a non-equivalent three group design (Cook and Campbell, 1979). Subjects were teachers and related specialists who had taken courses in developmental and/or diagnostic reading instruction. Since subjects' coursework background was a function of their own choice and not one assigned by the experimenter, this represents a non-random selection process. Therefore, the use of a non-equivalent desing was appropriate for this study. Responses were analyzed using Chi-square and Kruskall-Wallis techniques.

The 94 subjects participating in the study were selected from two pools of students enrolled in education classes at two universities with undergraduate and graduate degree programs in developmental and remedial reading instruction. The classes at both universities seemed comparable with relation to course objectives, required readings and class projects. Therefore, the subjects from each university were grouped according to their coursework backgrounds. Subjects were assigned to one of three groups. The groups were as follows: a) those having taken developmental and diagnostic reading instruction courses (N-15, Gr. 1); b) those having taken only diagnostic reading instruction courses (N-17, Gr. 2) and c) those having taken only developmental reading instruction courses (N-62, Gr. 3). Subjects were also studied according to years of teaching experience. The following is a description of subjects' experience: Student teachers - 27; 1-3 years - 31; 4-7 years - 27; 8 or more years - 9.

Subjects were asked to develop diagnoses and prescriptive/instructional plans for four case studies. Each case study was characterized by a different reading problem representative of those experienced by children learning to read. The names and characteristic reading difficulty of each case were as follows:

Adam (3rd grade) sight word problem
Dionne (4th grade) comprehension problem
Carlos (3rd grade) language difference
Erin (2nd grade) neurological problem

A statement of a child's name, age, race, sex, grade placement and instructional reading level were provided. Subjects had 20 minutes in which to choose information from five categories to include: Family/Community, Developmental, Psychological, Education

and Performance. These categories replicate the kinds of information thought useful in the diagnosis and remediation of reading problems as discussed in Goodman (1985), Otto and Smith (1980), Rupley and Blair (1979), Spache (1976) and Strang (1969). Each category contained three levels of information, with each succeeding level from one to three consisting of more detailed information. Level 1 contained general background information regarding height, weight, major illnesses, family member composition, interests, student's peer relationships and attitude toward school, current grades, IQ, and gross measures of reading performance. Levels 2 and 3 recycled Level 1 information in more detail. For example, they included hearing, vision and Bender-Visual-Motor Gestalt test results, interests, verbal performance and subtest scores on the WISC, history of previous school and achievement test performance and performance on specific reading tests.

Subjects were instructed to examine levels sequentially with Level 1 required to be the first choice before moving to Levels 2 and 3. They had 10 minutes to write the following: a) determination of reading strengths and needs b) need for referral, c) determination of learning style, d) teaching objectives and e) instructional strategies. Time limitations for examination of each case study were imposed purposely in order to study subjects' decision-making process under conditions similar to those in the classroom.

The responses of the subjects were evaluated according to the judgments of three experts in the field of reading representing curriculum and instruction and educational psychology backgrounds.

The experts were all doctoral level professionals with extensive experience in reading instruction, diagnosis and remediation. Their judgments provided criteria with which to evaluate the diagnostic and instructional decisions made by the subjcets. Where unanimity was not obtained, the agreement of two out of three experts regarding any variable was used as criteria for scoring.

Examination of the information search strategies utilized by the subjects was conducted as follows: 1) first choice of information search was noted, 2) the number of categories searched or depth of search from Levels 1 to 3 were counted and 3) the frequency with which subjects shifted from one category to another was counted. There was no judgment made as to appropriateness of search strategies employed, in the scoring of these variables.

The following hypotheses were tested:

1. The first choices of information searched by Gr. 1 or Gr. 2 would vary significantly more than the first choices of Gr. 3.

2. The total number of pieces of information searched by Gr. 1 or Gr. 2 would be significantly fewer than the total number searched by Gr. 3.

3. The total number of shifts from one category to another or one level to another would be significantly fewer for Gr. 1 or Gr. 2, than for Gr. 3.

4. The determination of reading levels, strengths and needs made by Gr. 1 or Gr. 2 would be significantly more accurate than the determination made by Gr. 3.

5. The determination of objectives for remediation and the quality of objective statements made by Gr. 1 or Gr. 3 would be significantly more accurate and qualitatively better than the determinations made by Gr. 3.

6. The determination of teaching strategies for remediation made by Gr. 1 or Gr. 3 would be significantly more accurate than those made by Gr. 2.

7. Teaching strategies would be sequenced from simple to complex more frequently by Gr. 1 or Gr. 3 than Gr. 2.

8. The determination of need for referral and reason for referral made by Gr. 1 or Gr. 3 would be more accurate than the determination by Gr. 2.

9. The diagnostic and prescriptive decisions made by subjects in any group with more years of experience would be significantly more accurate than those made by subjects in any group with fewer years of teaching experience.

Results

The purpose of the study was to examine the competency of teachers and related specialists on performance measures to determine the relationship of preparation and years of teaching experience to diagnostic and prescriptive decision-making. It was predicted that different course background, ie. in developmental and/or diagnostic reading instruction, and differences in years of teaching experience would influence performance. The assumption accompanying these predictors was that different types of coursework would increase subject competency in the content area, thereby helping subjects perform more effectively on tasks related to those content areas.

For example, it was predicted by the hypotheses regarding information search strategies that subjects with a broad background in diagnosis and developmental reading instruction, or only diagnostic courses would be more systematic in their information search strategies than would subjects whose backgrounds were limited to developmental reading. Predictions regarding significantly more effective performance in designing and implementing remedial teaching activities were made for subjects having taken only developmental reading courses or a combination of developmental and diagnostic reading courses

than performance by subjects having taken only diagnostic course-work.

Analysis of the data demonstrated no difference between Gr. 1 and 2 and 3 across all case studies. Instead a difference in performance by Gr. 1, 2 and 3 on the hypotheses was identified between relatively few case studies. For example, Gr. 3 accessed a greater variety of information than did subjects in Gr. 1 and 2, only for the case study Erin (neurological problem). Analysis demonstrated that for two case studies (Adam-sight word problem, and Erin-neurological problem) subjects in Gr. 3 searched less information than subjects in Gr. 1 or 2. Gr. 2 and Gr. 3 identified reading strengths for Carlos (language difference) more frequently than did subjects in Gr. 1. In addition, student teachers performed more effectively than teachers with eight or more years of teaching experience in determining instructional reading levels for the case study students. Teachers with one to three years of experience, however, identified the frustration reading level of Adam (sight word problem) more accurately than did student teachers.

The performance of Grs. 1, 2 and 3 was, for the most part, opposite that predicted. The results of this study demonstrated little relationship between an academic background in diagnostic and prescriptive coursework and performance on representative case studies.

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Insert Table I

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TABLE I

SUMMARY OF GROUP PERFORMANCE PER HYPOTHESIS (Summed over all case studies and for specific case studies in which significant differences were demonstrated.)

Hypothesis 1 The first choices of information search by Gr. 1 or Gr. 2 would vary significantly more than the first choices of Gr. 3.

Result: Gr. 1 = Gr. 2 = Gr. 3
Erin (neurological problem) Gr. 1, Gr. 2 > Gr. 3

Hypothesis 2 The total number of pieces of information search by Gr. 1 or Gr. 2 would be significantly fewer than the total number searched by Gr. 3.

Result: Gr. 1 = Gr. 2 = Gr. 3

Hypothesis 3 The total number of shifts from one category to another or one level to another would be significantly fewer for Gr. 1 or Gr. 2, than for Gr. 3.

Result: Gr. 1 = Gr. 2 = Gr. 3

Hypothesis 4 The determination of reading levels, strengths and needs made by Gr. 1 or Gr. 2 would be significantly more accurate than the determination made by Gr. 3.

Result: Gr. 1 = Gr. 2 = Gr. 3
Determination of reading strengths-Carlos (language difference) Gr. 3, Gr. 2 > Gr. 1

Hypothesis 5 The determination of objectives for remediation and the quality of objectivestatements made by Gr. 1 or Gr. 3 would be significantly more accurate and qualitatively better than the determinations made by Gr. 3.

Result: Gr. 1 = Gr. 2 = Gr. 3

Hypothesis 6 The determination of teaching strategies for remediation made by Gr. 1 or Gr. 3 would be significantly more accurate than those made by Gr. 2.

Result: Gr. 1 = Gr. 2 = Gr. 3

Hypothesis 7 Teaching strategies would be sequenced from simple to complex more frequently by Gr. 1 or Gr. 3 than Gr. 2.

Result: Gr. 1 = Gr. 2 = Gr. 3

TABLE I (Continued)

Hypothesis 8 The determination of need for referral and reason for referral made by Gr. 1 or Gr. 3 would be more accurate than the determination by Gr. 2.

Result: Gr. 1 = Gr. 2 = Gr. 3
Reason for referral -Dionne (comprehension problem)
Gr. 1 > Gr. 3

Hypothesis 9 The diagnostic and prescriptive decisions made by subjects in any group with more years of experience would be significantly more accurate than those made by subjects in any group with fewer years of teaching experience.

Result: Gr. 1 = Gr. 2 = Gr. 3
Determination of frustration reading level- Adam (sight word problem) 1-3 years > 0 years

Determination of instructional reading level
0 years > 8 or more years

Discussion

A teacher's responsibilities in instruction include the development and implementation of instructional plans for the majority of students in a classroom, with a determination of the need for specialist referral when a child's difficulties are not amenable to ordinary remedial strategies. At this point related specialists such as reading resource personnel or child psychologists take over to diagnose reading or learning problems for the purpose of developing remedials plans to be implemented by the classroom teacher. Schools of Education influence performance on these tasks by providing courses addressed to developmental and diagnostic reading (Spache, 1976a).

Whether or not teaching experience or types of coursework background are predictive of acutal teacher performance is an empirical question. For example, Ausubel and Robinson (1969) found that the amount of coursework preparation in a teacher's specialty area provided only a low positive prediction of how well teachers would be able to facilitate student learning. Similarly, although years of teaching experience have been suggested as an influence on teacher performance (Spache and Baggett, 1965), the impact has not been demonstrated conclusively. Furthermore, Reynolds (1979) has questioned whether traditional means of teacher preparation and certification are adequate in assuring teachers will be able to perform required tasks. According to Ruddell (1985), Artley (1972) and Rutherford and Weaver (1974), surveys of teachers have reflected their dissatisfaction with preparation programs in meeting classroom needs. Evidently

certification criteria developed for teacher-training are also insufficient from the standpoint of those receiving training (Weaver, 1984).

As a result of these criticisms, certification and teacher training programs are currently under examination. In addition, court-ordered changes have expanded teacher responsibility for educational services to include diagnosis of reading needs and the implementation of teacher-devised remedial plans. These legislative demands come in the wake of increasing classroom diversity, as a function of enrollment, exemplifying: a) wide ranges of ability, b) a variety of language and cultural experiences, c) a variety of learning styles and d) differences in learning needs. Thus, there is a practical need for: 1) accurate predictors of teacher performance and 2) teacher training programs that keep pace with the socio-political changes in teacher responsiblities.

The results of this study suggest continuing concern with traditional criteria as predictive of present demands on teacher performance in reading instruction. In addition, the results suggest continuing evaluation of teacher training programs in preparation of teachers for new responsiblities in light of social changes.

Findings of this study strongly suggest competency-based instruction along lines proposed by the Northwest Regional Laboratory (Schalock, 1968), as an alternative to traditional instruction based on the accumulation of credit hours in various types of coursework. In competency-based instruction mastery of content

and skills is measured as students progress through their preparation programs. Advancement to new content or skill areas, or extended instruction in a particular content or skill is dependent on the demonstrated mastery of prerequisite knowledge and skills (Smith, 1971; Schalock, 1968). A similar hierarchical model of mastery is used in medical training. Preliminary mastery of skills and knowledge is measured by interaction with patient case studies programmed for interactive computer problem-solving. Successful resolution of patient problems is a prerequisite for advanced instruction (Burzinski, et al., 1979; Ward, 1979; Katz, et al., 1978). It seems that with an increased focus on the effectiveness of educational preparation in medicine as well as education, academic training focusing on the acquisition of competencies not the accumulation of a variety of course credits is essential.

Measurement of the knowledge and skills acquired by students following course instruction seems to be important not only for prediction of performance but also leads to some guarantee that individual student needs will be met. Without a strong reading background, teachers may contribute to the perpetuation of reading problems (Otto and Smith, 1980; Rupley and Blair, 1979; Chall, 1978; Stauffer, et al., 1978). In addition, as suggested by Ruddell (1985), Artley (1972) and Rutherford and Weaver (1974), teachers themselves do not feel prepared to meet their students' needs. The results of this study support both professional and teacher concerns regarding the delivery of effective reading instruction remediation. As demonstrated in this study, performance

by all groups on the critical steps of diagnosis and remediation was inadequate.

In conclusion, coursework preparation and teaching experience, variables traditionally used to predict teacher effectiveness, did not seem to be related to differential performance on diagnostic and prescriptive decision-making. In addition, subjects performed poorly on these tasks, compared to expert judgment. The results of this study seem to confirm the concerns of teacher-educators and teachers alike. Preparation of teachers and related specialists does not seem to be keeping pace with current socio-political changes in teacher responsibilities.

For example, while it is generally accepted that the accumulation and interpetation of data regarding students' reading problems is essential to diagnostic decision-making, ireespective of teaching or academic background, subjects used inefficient search strategies to access information reagrding students' reading problems. Subjects did not seem to be guided by hypotheses as to what information would be most helpful in making diagnostic decisions. Considering the increasing responsibilities being delegated to teachers and the decreasing amount of time given to fulfill these responsibilities, efficient information search strategies seem necessary. Teachers and related specialists must be able to make effective use of their time and resources. To fail to do so would result in a delay in diagnostic decision-making, and thereby delay solution of students' reading problems. Ultimately, this would increase teachers' and students' frustration in the learning situation.

In this study teachers and related specialists, particularly those with diagnostic course backgrounds, seemed unable to make accurate diagnostic decisions to include determination of students' reading levels, strengths and needs. The development and implementation of individualized instruction is based on these decisions, and has been cited as necessary for effective remediation. It is essential to determine students' reading levels so that instruction is begun at the level at which a student will be able to do the work asked of him/her. To fail to do so would result in students being bored or frustrated by their reading instruction. The determination of strengths in necessary so that instruction begun at a student's level of ability can include tasks at which the student can succeed. Without immediate success experiences, students' motivation most likely will not be sparked enough to encourage further cooperation and effort in tackling his/her reading problem. Students' needs must be determined so that remediation is not an aimless pursuit of increased reading performance, but one which is directed at increasing students' skills in deficit areas.

Performance by subjects in this study, particularly those with a developmental course background, on prescriptive planning tasks was also poor. Subjects seemed unable to accurately determine: 1) need and reason for referral, 2) behaviorally stated objectives and 3) teaching strategies sequenced from simple to complex. However, as with diagnostic decision-making, the development and implementation of remedial instruction is dependent on these tasks.

For example, it is essential that the appropriate decisions be made as to need for student referral and to whom the student should be referred. Referral to sources outside the classroom for some students is traumatic, or degrading. For others it is the final outcome of students' manipulative efforts to be removed from class. While there is a definite need for referral for some students, it is necessary to be as accurate as possible in these determinations to avoid adverse effects on some students, and to save time and resources in working with others. However, subjects failed to make these determinations accurately, leading to the conclusion that when faced with these decisions, they would refer students for help inappropriately.

Accompanying the decision regarding need and reason for referral are those related to the development of remedial instruction plans. To increase the effectiveness of instruction, behavioral objectives appropriate to students' needs and a determination of appropriate teaching strategies, sequenced from simple to complex, must be developed.

The ability to develop behavioral objectives related to what a student is able and needs to be able to do, is essential if remedial instruction is to be helpful. Without the guidance of such objectives, instruction is a day-to-day proposition with no continuity, or opportunity to measure achievement. In this study subjects failed to address students' strengths and needs, and were unable to state the objectives they did determine behaviorally. Subjects also did not match appropriate teaching

methods to students' reading problems, not did they attempt to sequence tasks inherent in these methods from simple experiences to those that were more complex. There are a variety of methods developed for reading instruction, however, not all methods are amenable to solution of all students' problems. Therefore, discriminate choices must be made to facilitate the most efficient and effective remedial instruction. Although this skill and that of developing appropriate behavioral objectives is most commonly discussed in teacher texts and preservice developmental reading course background did not seem to generalize academic experience to practice.

The results of this study, therefore, raise issues pertinent to the efficacy of teacher training programs in classroom reading instruction. These issues may be summarized into three questions. They are:

1) What is required in terms of teacher training to help develop professionals able to teach reading effectively? It is neither efficient nor possible to require teachers to earn graduate degrees and 5-10 years of elementary teaching experience (especially good experience), before giving them the responsibility of teaching reading.

2) What can inservice teacher training programs offer teachers to help them develop effective diagnostic and prescriptive skills?

3) While seeking answers to the first two questions, how can students currently enrolled be helped to learn to read effectively, at a time when reading is critical to survival in an age of information?

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